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EXAMINER	
PITARO, RYAN F	

ART UNIT	PAPER NUMBER
2174	

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/799,451	ARNSTEIN ET AL.	
	Examiner	Art Unit	
	Ryan F Pitaro	2174	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-28 have been examined.

Specification

2. The abstract of the disclosure is objected to because "as wells ad driving robotic apparatus" should be "as well as driving a robotic apparatus". Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1,13,14,17,24 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kim et al ("Kim", Migration Prediction in Ubiquitous Computing) in view of sosmath ("sosmath", Multiplication of Matrices).

As per independent claim 1, Kim discloses a method digital models of flow processes, the method comprising: creating digital representations of at least two hierarchical nodes, each of the hierarchical nodes having associated therewith a respective dimensionality defining a number of dimensions of the respective hierarchical node, the respective dimensions of each of the hierarchical nodes having a defined

order with respect to one another, each dimension having an associated size defining a number of members of the respective dimension (Page 3 Figure 1;*wherein each icon shows the number of dimensions on the left hand side)*; creating digital representations of a number of hierarchical edges defining connections between at least some of the hierarchical nodes, at least a first one of the hierarchical edges defining a connection between a first and a second one of the at least two hierarchical nodes (Page 3 Figure 1; *wherein the edges are shown from a plurality of nodes*). Kim fails to distinctly point out showing a matrix of nodes and edges depending on match rules although it may be inherent. However, sosmath teaches for each of a number of pairs of hierarchical nodes connected by a respective shared one of the hierarchical edges (Page 2 lines 12-15; *matrix multiplication*), associating at least one of a number of match rules with the pair of hierarchical nodes, each of the match rules defining at least one matrix transformation between the hierarchical nodes of the respective pair (Page 2 lines 16-17; A*B=C), application of the matrix transformation to the members of the hierarchical nodes of the respective pair defining a resulting set of primitive nodes and primitive edges, where a first one of the number of match rules defines a first matrix transformation between the first and the second hierarchical nodes (Page 2 lines 16-17; *represented by C*). Therefore it would have been obvious to an artisan at the time of the invention to combine the method of Kim with the teaching of sosmath. Motivation to do so would be to provide a way to combine the multi-dimensional nodes of Kim.

Claims 13,14,17,24 are individually similar in scope to that of claim 1, and are therefore rejected under similar rationale.

5. Claims 4-11,15,21,23,26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al ("Kim", Migration Prediction in Ubiquitous Computing) in view of sosmath ("sosmath", Multiplication of Matrices).

As per claim 4, which is dependent on claim 1, Kim-sosmath discloses receiving a first set of user inputs identifying selection of a first icon representing the first hierarchical node of the at least two hierarchical nodes, a human-readable name of the first hierarchical node, and identifying the dimensionality indicating the total number of dimensions for the first hierarchical node, the size of each of the respective dimensions and a human-readable name for each of the dimensions (Page 3 Figure 1).

As per claim 5, which is dependent on claim 1, Kim-sosmath discloses receiving a first set of user inputs identifying selection of a first icon representing the first hierarchical node of the at least two hierarchical nodes, a human-readable name of the first hierarchical node, and identifying the dimensionality indicating the total number of dimensions for the first hierarchical node, and the order of the dimensions with respect to one another, and a size of each of the respective dimensions (Page 3 Figure 1).

As per claim 6, which is dependent on claim 1, Kim fails to distinctly point out creating a number of primitive nodes to fill the dimensions. However, sosmath teaches a method for each of the hierarchical nodes, automatically creating digital representations of a number of primitive nodes to fill in the respective dimensions, based on the number of dimensions and the size of each of the dimensions of the respective hierarchical node (Page 2 lines 12-15;*wherein A is mxn, B is kx1, C is mx1.* Therefore it would have been obvious to an artisan at the to combine the method of Kim with the teaching of

sosmath. Motivation to do so would be to provide a way to combine the multi-dimensional nodes of Kim according to some match rule.

As per claim 7, which is dependent on claim 6, Kim-sosmath teaches a method for each pair of hierarchical nodes connected by a respective shared one of the hierarchical edges, automatically creating digital representations of primitive edges between primitive nodes based on the matrix transformation defined by the match rule associated with the respective pair of hierarchical nodes (sosmath, Page 2 lines 16-17; *wherein C is the transformed matrix*).

As per claim 8, which is dependent on claim 7, Kim-sosmath teaches a method detecting a change to at least one of the hierarchical nodes or at least one of the hierarchical edges (sosmath, Pages 2 lines 10-11; *wherein matrix A is being multiplied by Matrix B)*; and in response to the detected change, for each of the hierarchical nodes, automatically recreating digital representations of the number of primitive nodes to fill in the respective dimensions, based on the number of dimensions and the size of each of the dimensions of the respective one of the hierarchical nodes (sosmath, Page 2 lines 12-15;*wherein A is mxn B is kx1 therefore n=k)*.

As per claim 9, which is dependent on claim 7, Kim-sosmath teaches a method detecting a change to at least one of the hierarchical nodes or at least one of the hierarchical edges (sosmath, Pages 2 lines 10-11; *wherein matrix A is being multiplied by Matrix B)*; and in response to the detected change, for each of the hierarchical nodes, automatically recreating digital representations of the number of primitive nodes to fill in the respective dimensions, based on the number of dimensions and the size of

each of the dimensions of the respective one of the hierarchical nodes and automatically recreating digital representations of primitive edges between primitive nodes based on the matrix transformation defined by the match rule associated with the respective pair of hierarchical nodes (sosmath, Page 2 lines 16-17).

As per claim 10, which is dependent on claim 9, Kim-sosmath teaches a method determining that a user has directed suppression of application of at least one of the match rules to at least one of the primitive nodes or at least one of the primitive edges; and selectively suppressing of the recreating of at least one of the primitive nodes or at least one of the primitive edges based on user directed suppression of the at least one match rule to the at least one of the primitive nodes or at least one of the primitive edges (Page 2 lines 12-17; *matrix multiplication*).

As per claim 11, which is dependent on claim 1, Kim-sosmath teaches a method producing a visual representation of the primitive nodes and primitive edges (sosmath, Page 2 lines 10-11).

As per claim 15, which is dependent on claim 13, Kim-sosmath fails to distinctly point out a display operable to display all the edges and nodes of the system. However, Official Notice is taken that a display operable to display primitive nodes and edges is well known in the art. A touch screen panel can be seen (Kim, Page 3 Figure 1) displaying hierarchical nodes and edges, since the primitive nodes and edges are represented digitally the same way. The touch screen panel is operable to display the primitive nodes and edges. Therefore it would have been obvious to an artisan at the

time of the invention to combine Kim-sosmath with the current teaching. Motivation to do so would have been to allow the display to show all edges and nodes.

As per claim 21, which is dependent on claim 17, Kim fails to distinctly point out ordering members along the dimension. However, sosmath teaches ordering members along the dimension (Page 2 lines 12-17; *wherein the matrix nodes are distinguishable by order i.e. (1,2)=d).* Therefore it would have been obvious to an artisan at the to combine the method of Kim with the teaching of sosmath. Motivation to do so would be to provide a way to distinguish the multi-dimensional nodes of Kim.

As per claim 23, which is dependent on claim 17, Kim fails to distinctly point out showing the dimensionality of the first and second hierarchical nodes. However, sosmath teaches the computer readable medium wherein the dimensionality of at least one of the first and the second hierarchical nodes is two and the dimensions correspond to a row and a column perpendicular to the row (Page 2 lines 12-17, wherein A=mxn or 2x3). Therefore it would have been obvious to an artisan at the to combine the method of Kim with the teaching of sosmath. Motivation to do so would be to provide a way to distinguish the multi-dimensional nodes of Kim.

As per claim 26, which is dependent on claim 24, Kim discloses a method wherein a first hierarchical node corresponds to a first material, a second hierarchical node corresponds to a second material, and a third hierarchical node corresponds to an operation to be performed on the first and the second material, a first edge connects the first hierarchical node to the third hierarchical node and a second edge connects the second hierarchical node to the third hierarchical node (Page 3 Figure 1).

As per claim 27, which is dependent on claim 26, Kim fails to distinctly point out the method of representing a matrix combination. However, sosmath teaches a method wherein automatically creating a number of primitive nodes to at least partially fill at least one Cartesian dimension of the respective one of hierarchical nodes comprises creating a number of primitive nodes representing rows of the first hierarchical node (Page 2 lines 16-17; *A*), creating a number of primitive nodes representing columns of the second hierarchical node (Page 2 lines 16-17; *B*), and creating a number of rows and columns of primitive nodes representing the third hierarchical node (Page 2 lines 16-17; C), the number of rows representing the third hierarchical node matching a number of rows in the first hierarchical node and the number of columns representing the third hierarchical node matching a number of columns in the second hierarchical node (Page 2 lines 16-17; *C wherein A is mxn B is kx1 and C is mx1*). Therefore it would have been obvious to an artisan at the to combine the method of Kim with the teaching of sosmath. Motivation to do so would be to provide a way to represent the multi-dimensional nodes of Kim.

As per claim 28, which is dependent on claim 27, Kim fails to distinctly point out matrix multiplication. However, sosmath teaches a method wherein automatically creating of a number of primitive edge connections between the automatically created primitive nodes based on a match rule associated with a connected pair the hierarchical nodes comprises creating an edge connection from each of a number of primitive node representing respective rows in the first hierarchical node to each of the primitive nodes in a respective row of the third hierarchical node, and creating an edge connection from

each of a number of primitive nodes representing respective columns in the second hierarchical node to each of the primitive nodes in a respective column of the third hierarchical node (Page 2 lines 12-17; matrix multiplication). Therefore it would have been obvious to an artisan at the to combine the method of Kim with the teaching of sosmath. Motivation to do so would be to provide a way to represent the multiplication of the multi-dimensional nodes of Kim.

6. Claims 2,3,25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al ("Kim", Migration Prediction in Ubiquitous Computing) in view of sosmath ("sosmath", Multiplication of Matrices) in further view of Hanselman et al ("Hanselman", The Student Edition of Matlab).

As per claim 2, which is dependent on claim 1, Kim and sosmath fail to distinctly point out inputting the dimensions for each of the nodes. However, Hanselman teaches a method comprising receiving a first set of user inputs identifying selection of a first icon representing a first hierarchical node of the at least two hierarchical nodes (Page 68 lines 6-9), and identifying a dimensionality indicating a total number of dimensions for the first hierarchical node and a size of each of the respective dimensions (Page 66 lines 31-33); and receiving a second set of user inputs identifying selection of a first icon representing a second hierarchical node of the at least two hierarchical nodes (Page 68 lines 10-13), and identifying a dimensionality indicating a total number of dimensions for the second hierarchical node and a size of each of the respective dimensions (Page 66 lines 31-33). Therefore it would have been obvious to an artisan at the time of the invention to combine the method of Kim and sosmath with the current teaching of

Hanselman. Motivation to do so would have been to provide a graphical interface capable of receiving input to define the matrices, which the transformations are based upon.

As per claim 3, which is dependent on claim 2, Kim-sosmath-Hanselman disclose receiving a third set of user inputs identifying a first icon representing an edge extending from the first to the second hierarchical nodes (Kim, Page 3 Figure 1).

As per claim 25, which is dependent on claim 24, Kim-sosmath fails to distinctly point out associating properties of some primitive nodes defined by the match rule. However, Hanselman teaches a method associating properties with at least some of the primitive nodes, the properties associated with the primitive nodes corresponding to a property assigned to respective dimensions of the hierarchical nodes from which the primitive node is defined via the respective match rule (Page 66 array size; *wherein Matlab retains the array size of double after multiplication*). Therefore it would have been obvious to an artisan at the time of the invention to combine the method of Kim and sosmath with the current teaching of Hanselman. Motivation to do so would have been to keep the matrices consistent to reflect accurate results.

7. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being obvious over Kim et al ("Kim", Migration Prediction in Ubiquitous Computing) in view of sosmath ("sosmath", Multiplication of Matrices) in further view of Hung et al ("Hung", Labscape: A Smart Environment for the Cell Biology Laboratory).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art

only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

As per claim 18, which is dependent on claim 17, Kim-sosmath fails to teach a primitive operation or a primitive material. However, Hung teaches the member representing a primitive operation or a primitive material (Page 16 Figure 3). Therefore it would have been obvious to an artisan at the time of the invention to combine the medium of Kim-sosmath with the current teaching of Hung. Motivation to do so would have been to show the materials after the transformation to represent any changes.

As per claim 19, which is dependent on claim 17, Kim-sosmath fails to distinctly point out representing a primitive piece of information. However, Hung teaches each

member represents a primitive piece of information (Page 16 Figure 3). Therefore it would have been obvious to an artisan at the time of the invention to combine the medium of Kim-sosmath with the current teaching of Hung. Motivation to do so would have been to show the materials after the transformation to represent any changes.

As per claim 20, which is dependent on claim 17, Kim-sosmath-Hung teaches a medium wherein each member represents one of a primitive operation, a primitive material, or another hierarchical node (Hung, Page 16 Figure 3).

8. Claims 12,16,22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al ("Kim", Migration Prediction in Ubiquitous Computing) in view of sosmath ("sosmath", Multiplication of Matrices) in further view of Ganz et al ("Ganz", US 6,637,473).

As per claim 12, which is dependent on claim 11, Kim-sosmath fail to distinctly point out producing transducer signals. However, Ganz teaches producing a number of transducer drive signals corresponding to at least some of the primitive nodes and some of the primitive edges for driving a number of transducers (Column 3 lines 33-53; *camera controls based on the "matrix" or micro well plates"*). Therefore it would have been obvious to an artisan at the time of the invention to combine the method of Kim-sosmath with the current teaching of Ganz. Motivation to do so would have been to provide a way of relating the plates to a electrical driven device.

As per claim 16, which is dependent on claim 13, Kim-sosmath-Ganz discloses an output port couplable to provide control signals to one or robotic devices (Column 5 lines 2-17).

As per claim 22, which is dependent on claim 17, Kim-sosmath fails to distinctly point out a three dimensional layout. However, Ganz teaches a medium wherein the dimensionality of at least one of the first and the second hierarchical nodes is three and the dimensions correspond to an x-axis, a y-axis perpendicular to the x-axis, and a z-axis perpendicular to both the x-axis and the y-axis (Column 5 lines 2-5). Therefore it would have been obvious to an artisan at the time of the invention to combine the method of Kim-sosmath with the current teaching of Ganz. Motivation to do so would have been to provide representation of the micro well plates, having an x and y-axis per each plate, and z represents the different plates.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan F Pitaro whose telephone number is 571-272-4071. The examiner can normally be reached on 7:00am - 4:30pm Monday through Thursday, and alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kristine Kincaid can be reached on 571-272-4063. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ryan Pitaro
Art Unit 2174
Patent Examiner

RFP